
OWNER'S MANUAL

MILLING & DRILLING MACHINE

PM-940V-PDF

READ ALL INSTRUCTIONS CAREFULLY

Keep for future reference!

WARNING:FAILURE TO FOLLOW THESE RULES MAY RESULT IN SERIOUS PERSONAL INJURY

As with all machinery there are certain hazards involved with operation and use of the machine. Using the machine with respect and caution will considerably lessen the possibility of personal injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommends that this machine. NOT be modified and/or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you have had detail instruction from your dealer.

SAFETY RULES FOR ALL TOOLS

1.FOR YOUR OWN SAFETY ,READ THIS INSTRUCTION MANUAL BEFORE OPERATING THE TOOL. Learn the tool's application and limitations as well as the specific hazards peculiar to it.

2.KEEP GUARDS IN PLACE and in working order .

3.GROUND ALL TOOLS .If tool is equipped with three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong plug receptacle, the adapter lug must be attached to a know ground. Never remove the third prong.

4.REMOVE ADJUSTING AND WRENCHES.

Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it"on."

5.KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents.

6.DON'T USE IN DANGEROUS ENVIRONMENT .Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well- lighted.

7.KEEP CHILDRE AND VISITORS AWAY. All children and visitors should be keep a safe distance from work area.

8.MAKE WORKSHOP CHILDROOF –with padlocks, master switches, or by removing starter keys.

9.Don't force tool. It will do the job better and be safer at the rate for which it was designed.

10.USE RIGHT TOOL .Don't force tool or attachment to do a job for which it was not designed.

11.WEAR PROPER APPAREL. No loose clothing,gloves,neckties,rings, bracelets,or other jewelry to get caught in moving parts. Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.

12.ALWAYS WEAR EYE PROTECTION. Refer to ANSI Z87.1 Standard for appropriate recommendations. Also use face or dust mask if cutting operation is dusty.

13.SECURE WORK. Use clamps or a vise to hold work when practical. It's safer than using your hand and frees both hands to operate tool.

14.DON'T OVERREACH. Keep proper footing and balance at all times.

15.MAINTAIN TOOLS IN TOP CONDITION.

Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

16.DISCONNECT TOOLS before servicing and when changing accessories such as blades,bits,cutters,ect.

17.USE RECOMMENDED ACCESSORIES.

Consult the owner's manual for recommended accessories .The use of improper accessories may cause hazards.

18.AVOID ACCIDENTAL STARTING. Make sure switch is in "OFF" position before plugging in power cord.

19.NEVER STAND ON TOOL. Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted

20.CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function check for alignment of moving parts binding of moving parts, breakage of parts mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

21.DIRECTION OF FEED. Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

22.NEVER LEAVE TOOL RUNNING UNATTENDED.TURN POWER OFF.

Don't leave tool until it comes to a complete stop.

23.DRUGS,ALCOHOL ,MEDICATION. Do not operate tool while under the influence of drug, alcohol or any medication.

24.MAKE SURE TOOL IS DISCONNECTED FROM POWER SUPPLY while motor is being mounted, connected or reconnected.

ADDITIONAL SAFETY RULES FOR MILL DRILL

1. **BE SURE** drill bit or cutting tool is securely locked in the chuck.
2. **BE SURE** chuck key is removed from the chuck before turning on power.
3. **Adjust the table or depth stop to avoid drilling into the table.**
4. **SHUT OFF the power** ,remove the drill bit or cutting tool, and clean the table before leaving the machine.
5. **CAUTION.** When practical , use clamps or a vise to secure workpiece to keep the workpiece from rotating while the drill bit or cutting tool.
6. **WARNING:** FOR Your Own Safety Don't wear gloves when operating a mill/drill.

SPECIFICATIONS:

Drilling capacity	cast iron	32mm	
	mild steel	25mm	
Face mill capacity		80mm	
End mill capacity		32mm	
Working table size		1000mm×240mm	
Working table cross travel		300mm	
Working table longitudinal travel		600mm	
T-Slot size		14mm	
Head tilt left right		90°	
Spindle taper (option)		MT3 or MT4	R8 or ISO40
Max distance spindle to table		50–550mm	
Spindle stroke		125mm	
Spindle auto-feed speed		0.10/0.18/0.26mm/r	
Spindle speed(rpm)	L	100~1650	
	H	350–5000	
Overall dimension		1450mm×1000mm×2100mm	

WARNING:CHANGE SPEED ONLY WHEN MACHINE IS STOPPED

WARNING:SPINDLE AUTOMATIC FEED FUNCTION IS FORBIDDEN WHEN SPEED ABOVE 3000 rpm!

CLEANING

- (1) Your machine has been coated with a heavy grease to protect it in shipping. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.
- (2) After cleaning, coat all bright work with a light lubrication . Lubricate all points with a medium consistency machine oil.

LUBRICATION:

All ball bearings in your mill/drill are sealed for life ,requiring no lubrication. Points requiring lubrication are:

- (1) Internal spline drive assembly. Keep this area well lubricated with a good grade grease , insert grease in the hole at the top of spindle pulley spline driver,lube twice yearly.
- (2) A light film of oil applied to the quill and column will reduce wear, prevent rust, and assure ease of operation.
- (3) Quill return spring should receive oil(sae 20) once yearly. Remove cover plate and apply oil with squirt can or small brush.
- (4) Apply lubriplate to quill pinion every 90 days.

NOTE: use extreme care when performing this operation and keep hands clear of pinch points. When using paraffin bar, do this only by turning the sheaves by hand. Do not apply with motor running.

USE OF MAIN MACHINE PARTS

- (1) To raise and lower the head by head handle.
- (2) Equipped with an electric switch for tapping operation clockwise or counterclock wise.
- (3) To adjust the quick or slow feeding by feed handle.
- (4) To adjust the table left and right travel by table handle wheel.
- (5) To adjust the table fore and after travel by table handle wheel.
- (6) To operate the spindle handle wheel for micro feed.
- (7) To adjust the scale size according to working need.

PRECAUTION FOR OPERATION

Check all parts for proper condition before operation; if normal safety precautions are noticed carefully, this machine can provide you withstanding of accurate service.

- (1) Before Operation

- (a) Fill the lubricant
 - (b) In order to keep the accurate precision, the table must be free from dust and oil deposits.
 - (c) Check to see that the tools are correctly set and the workpiece is set firmly.
 - (d) Be sure the speed is not set too fast.
 - (e) Be sure everything is ready before use
- (2) After Operation
- (a) Turn off the electric switch.
 - (b) Turn down the tools.
 - (c) Clean the machine and coat it with lubricant.
 - (d) Cover the machine with cloth to keep out the dust.
- (3) Adjustment of head
- (a) To raise and lower the head, loosen the leaf screw located on the right side of the raise and lower base. When the desired height is reached tighten leaf screw to avoid vibration.
 - (b) Unscrew 3 nuts while the workpiece needs to be bevel turn to the degrees you wish on the scale, then screw the 3.

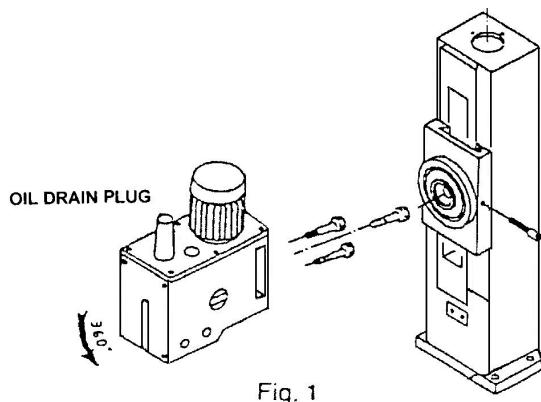


Fig. 1

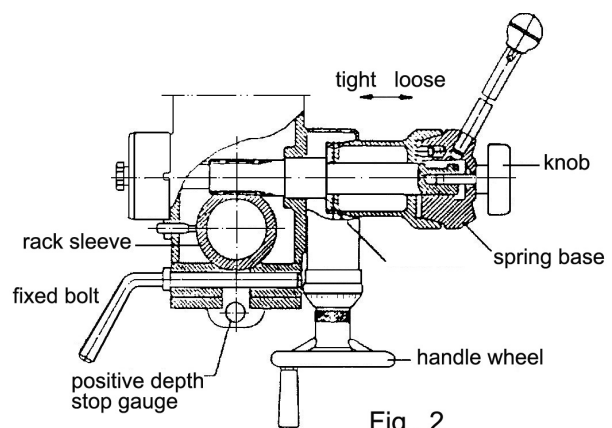


Fig. 2

QUILL RETURN SPRING ADJUSTMENT:

Spring tension for return of spindle, after hole drilling, has been pre-set at the factory. No further adjustment should be attempted unless absolutely necessary. Adjustment will probably be required if a multiple spindle drilling or tapping head is used. If adjustment is necessary, loosen lock screw while holding quill spring housing. Do not allow the housing to turn in your hand, or spring will unwind. Turn entire housing assembly clockwise the number of turns necessary to cause the quill to return to its up position. (NOTE: The flat of the spring housing pilot is lined up with the spring loading hole on the body of the spring housing.) Reset lockscrew make sure point of screw mates the

flat on the housing journal.

(1) Preparing for Drilling (see fig.2) (Except addition power feed system).

Turn of the knob make loose the taper body of worm gear and spring base. Then we decide spindle stroke setting the positive depth stop gauge for drilling blind hole or free state for pass hole.

(2) Preparing for Milling (see fig.2) (Except addition power feed system).

(a) Adjust the positive depth stop gauge to highest point position.

(b) Turn tight of the knob be use to taper friction force coupling the worm gear and spring base. Then turning the handle wheel by micro set the spindle of work piece machining height.

(c) Lock the rack sleeve at the desired height with fixed bolt.

ADJUSTING TABLE SLACK AND COMPENSATE FOR WEAR (see fig.3)

(1) Your machine is equipped with jib strip adjustment to compensate for wear and excess slack on cross and longitudinal travel.

(2) Clockwise rotation the job strip bolt with a big screw for excess slack otherwise a little counter clockwise if too tight.

(3) Adjust the jib strip bolt until feel a slight drag when shifting the table.

CLAMPING TABLE BASE AND MACHINE BASE (See Fig.3)

(1) When milling longitudinal feed. It is advisable to lock the cross feed table travel to insure the accuracy of your work. To do this, tighten the

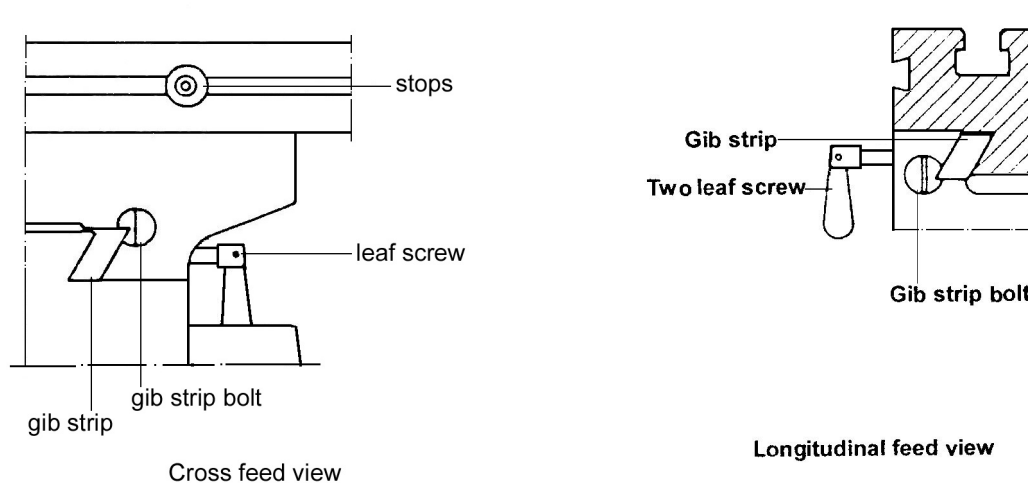


Fig.3

small leaf screw located on the right side of the table base.

(2) To tighten the longitudinal feed travel of the table for cross feed milling, tighten the two small leaf screw on the front of the table base.

(3) Adjustable travel stops are provided on the front of the table for control of cross travel and the desired milling length.

TO CHANGE TOOLS

(1) Removing Face Mill or Drill Chuck Arbor

Loosen the arbor bolt at the top of the spindle shaft approximately 2 turns with a wrench. Rpa the top of the arbor bolt with a mallet.

After taper has been broken loose, holding chuck arbor on hand and turn detach the arbor bolt with the other hand.

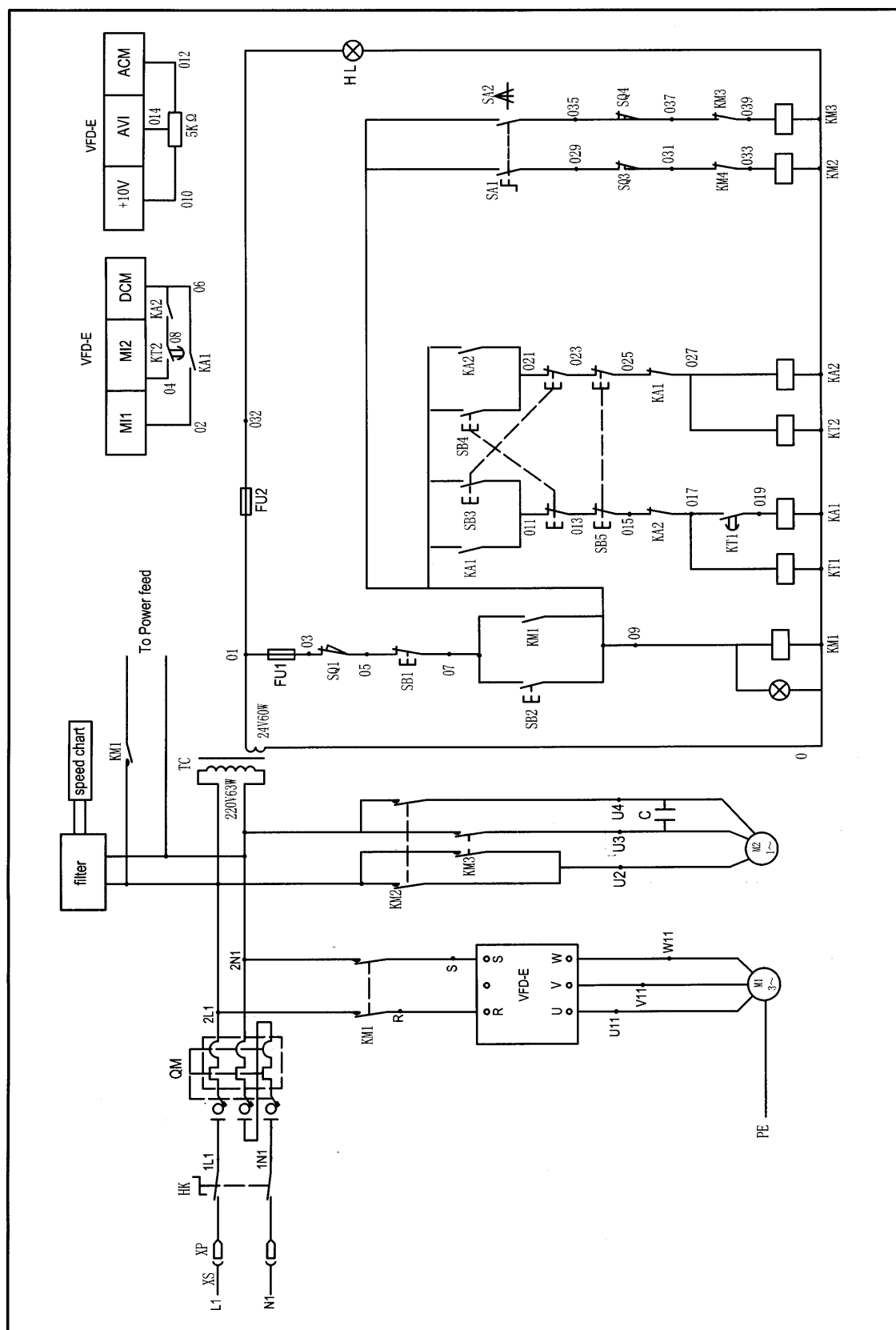
(2) To install Face Mill or Cutter Arbor

Insert cutter and cutter arbor bolt detach securely, but do not over-tighten.

(3) Removing Taper Drills

(a) Turn down the arbor bolt and insert the taper drill into the spindle shaft.

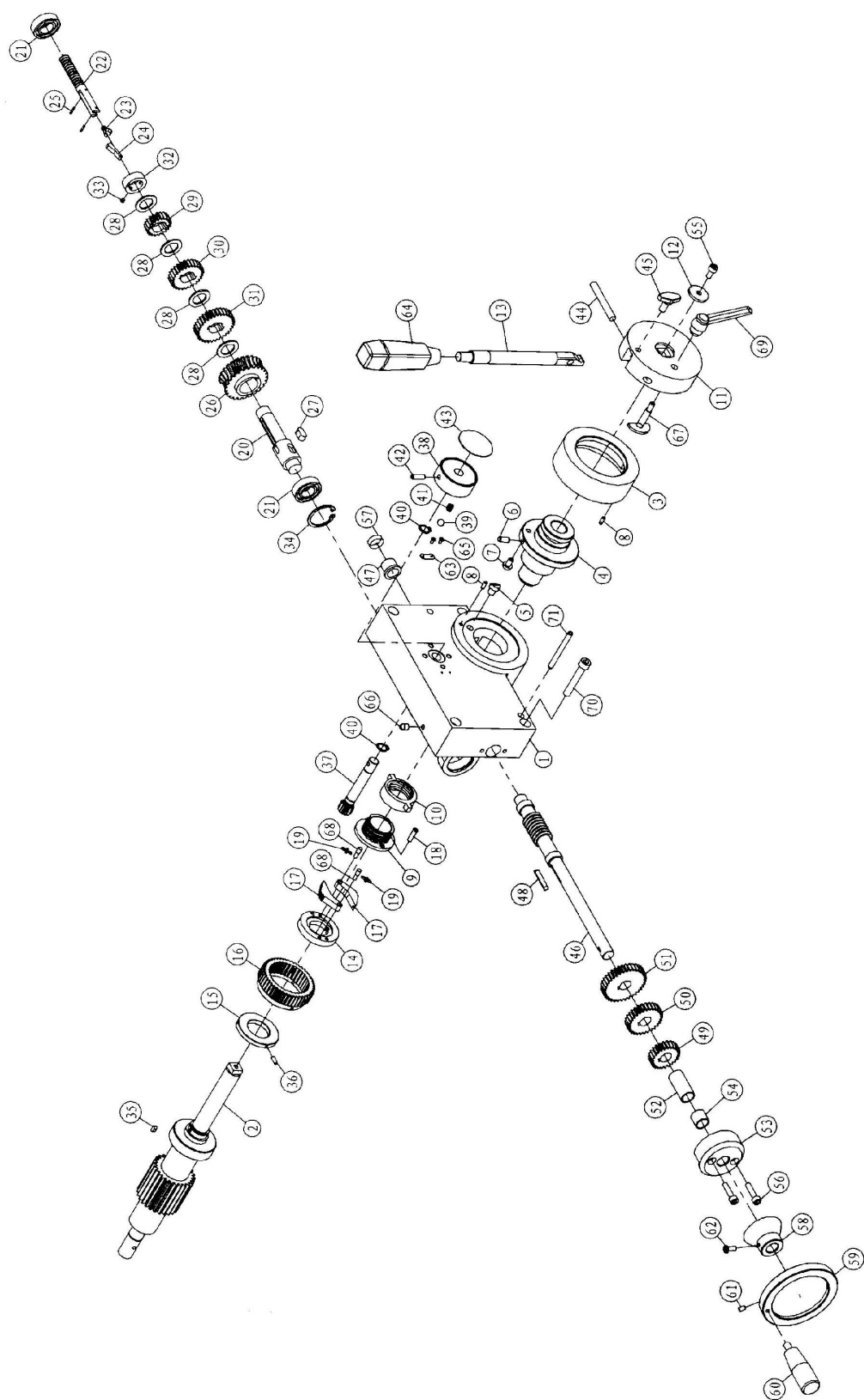
(b) Turn the rapid down handle rod down until the oblong hole in the rack sleeve appears. Line up this hole with the hole in the spindle. Insert key punch key through holes and strike lightly lightly with a mallet. This will force the taper drill out.



Maintenance instructions

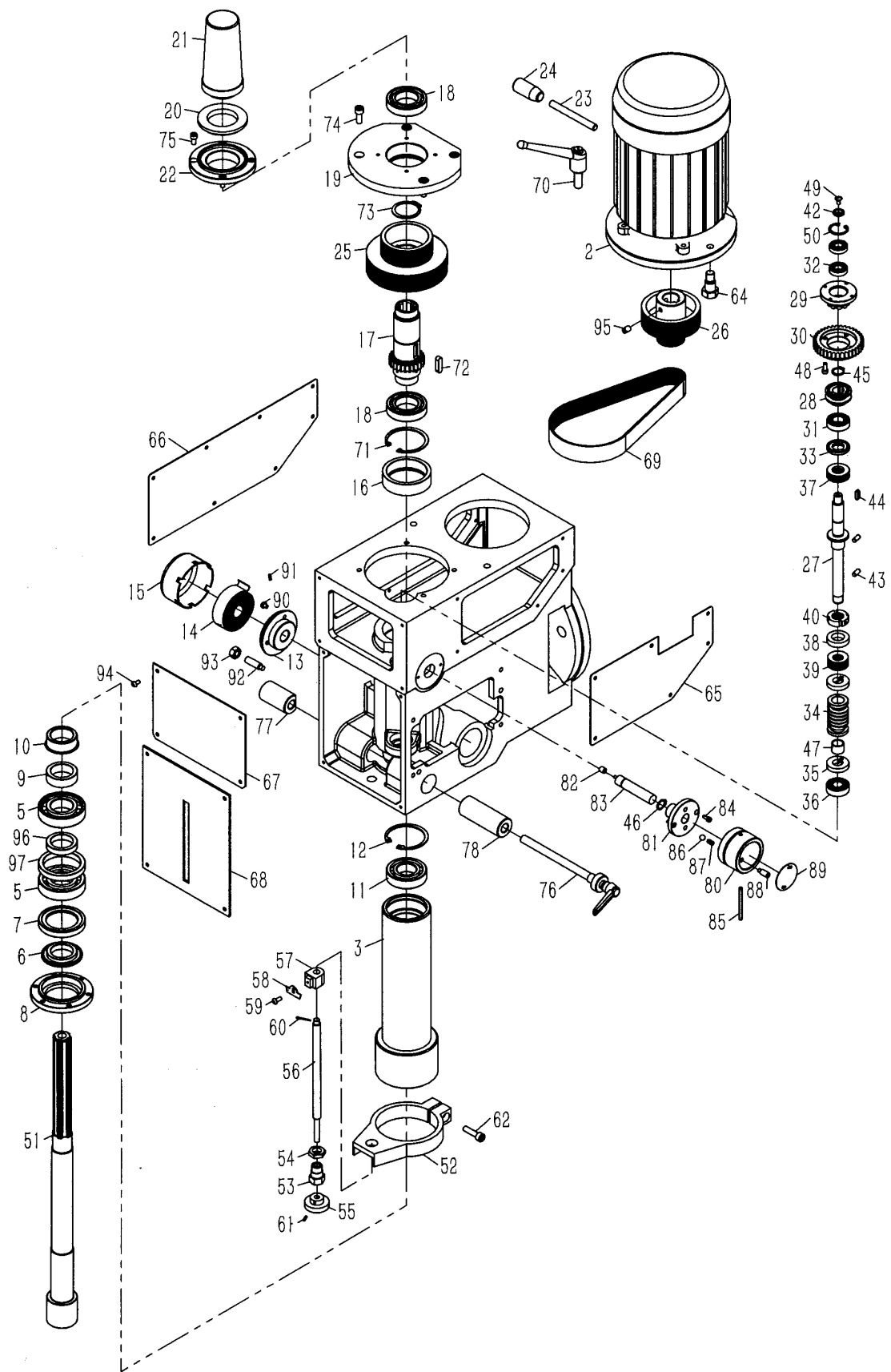
TROUBLE SHOOTING HINTS

TROUBLE	PROBABLE CAUSE	REMEDY
Excessive Vibration	1.Motor out of balance 2.Bad motor	1.Balance or replace problem motor. 2.Replace motor
Motor stalls	1.Over feeding. 2.Dull drill. 3.Motor not building up to running speed 4.Bad motor	1.Reduce feed rate. 2.Sharpen drill and keep sharp. 3.Replace or repair motor. Check fuses in all three legs on three phase motors and replace if necessary. 4.Replace motor.
Noisy Operation	1.Excessive vibration. 2.Improper quill adjustment. 3.Nosiy spline 4.Noisy motor	1.Check remedy under excessive vibration. 2.Adjust quill. 3.Lubricate spline. 4.Check motor bearings or for loose motor fan.
Drill or Tool heats up or burns work.	1.Excessive speed. 2.Chips not clearing. 3.Dull tool. 4.Feed reate too slow. 5.Rotation of drill incorrect. 6.Failure to use cutting oil or coolant(on steel)	1.Reduce speed. 2.Use pecking operation to clear chips. 3.Sharpen tool or replace. 4.Incresase feed enough to clear chips. 5.Reverse motor rotation. 6.Use cutting oil or coolant on steel
Drill leads off	1.No drill spot. 2.Cutting lips on drill off center. 3.Quill loose in head. 4.Bearing play.	1.Center punch or center drill workpiece. 2.Regrind drill. 3.Tighten quill. 4.Check bearings and reseal or replace if necessary.
Excessive drill runout or wobble	1.Bent drill. 2.Bearing play. 3.Drill not seated properly in chucks.	1.Replace drill. Do not attempt to straighten 2.Replace or reseal bearings. 3.Loosen,reseal and tighten chuck.
Work or fixture comes loose or spins	1.Failure to clamp workpiece or work holding device to table.	1.Clamp workpiece or work holding device to table surface.



FEED BOX PARTS

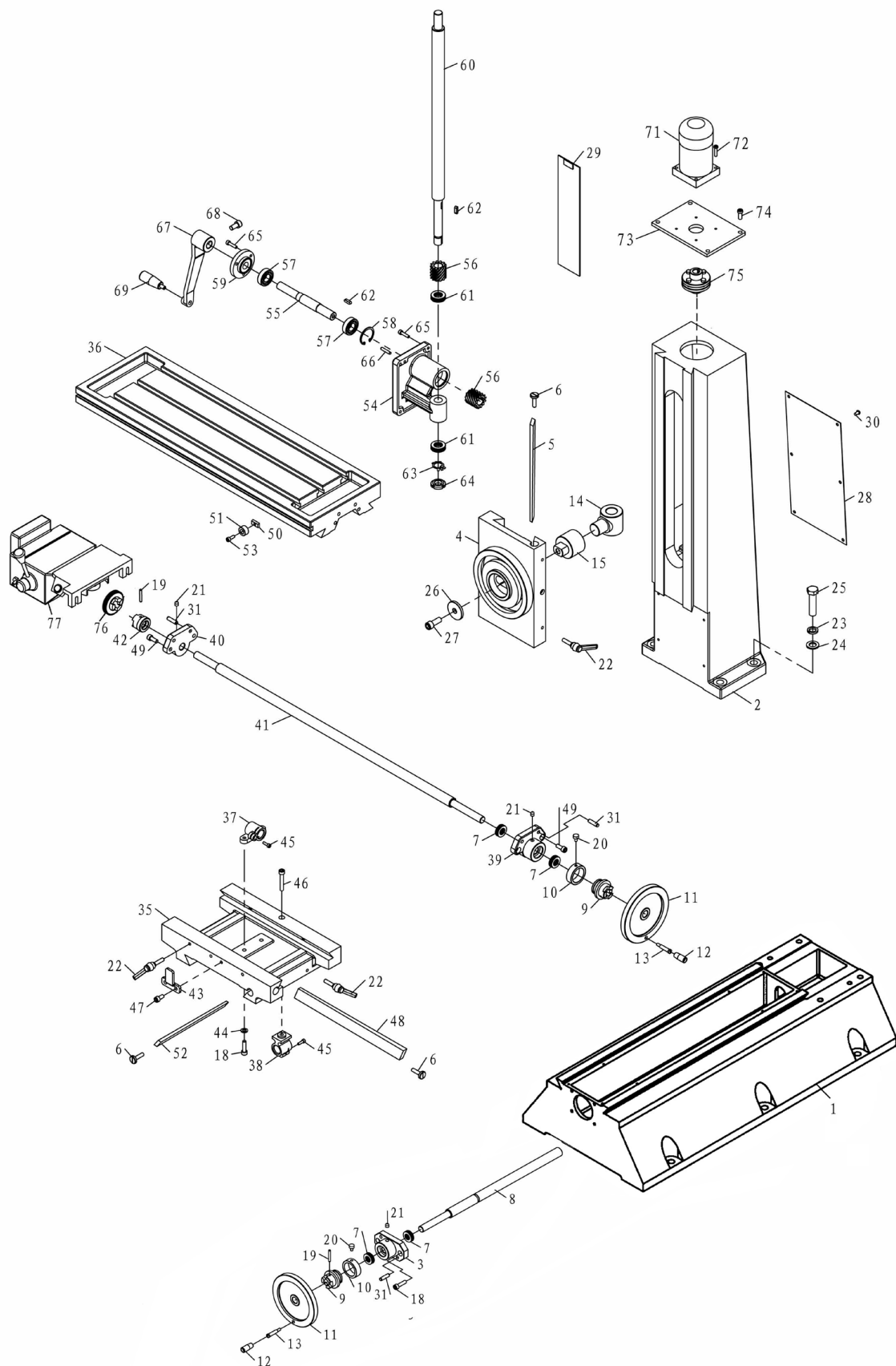
No.	Code	Qty.	Name	No.	Code	Qty.	Name
1	20102	1	Feed box	37	20202	1	Gear
2	20234	1	Pinion shaft	38	20201	1	Speed lever
3	20243	1	Spindle stroke dial	39		1	Steel ball 8
4	20242	1	Clutch bushing set	40		2	Retainer ring 12
5	20241	1	Backing pin	41		1	Spring
6		1	Pin 6×12	42		1	Screw M6×20
7	20247	1	Ball head pin	43	20303	1	Plate
8		2	Pin 4×10	44	20206	1	Knurled pin
9	20239	1	Square thread set	45	20204	1	Limited screw
10	20240	1	Square thread nut	46	20233	1	Worm shaft
11	20244	1	Handle body	47	20306	1	Bush
12	20245	2	Washer	48		1	Key
13	20203	1	Handle	49	20228	1	Gear
14	20237	1	Clutch key base set	50	20229	1	Gear
15	20236-2	1	Bush	51	20230	1	Gear
16	20236-1	1	Worm gear	52	20106	1	Bush
17	20231	2	Clutch screw set	53	20227	1	Worm cover
18	20235	2	Screw	54	20305	1	Bush
19	20232	2	Spring	55		1	Screw M6×12
20	20223	1	II Shaft	56		2	Screw M6×25
21		2	Bearing 6003	57	20107	1	Bushing
22	20215	1	Change gear lever set	58	20226	1	Mirco feed dial
23	20220	1	spring	59	20105	1	Hand wheel
24	20222	1	Pull key	60		1	Handle
25		2	Pin 2×10	61		1	Screw M5×8
26	20304	1	Worm gear	62		1	Locked screw M5×12
27		1	Key 8×16	63	20307	1	"0" Scale
28	20217	4	Bushing	64	20301	2	Knob
29	20218	1	Gear	65		2	Rivet 2×5
30	20219	1	Gear	66		1	Oil cup
31	20221	1	Gear	67	20246	1	Screw
32	20216	1	Bushing bracket	68	20308	2	Pin
33		2	Screw M4×6	69		1	Locked handle
34		1	Retainer ring 35	70		4	Screw M6×50
35		2	Key 4×8	71		2	Taper pin 6×60
36		3	Screw M4×12				



HEAD PARTS

No	Code	Qty	Name	No	Code	Qty	Name
1	PM940MC-101	1	head body	34	Z5032-2206	1	worm shaft
2		1	motor	35	Z5032-3302	2	mat
3	ZX30-20019T	1	spindle sleeve	36	6202	1	bearing
5	7207AC	2	bearing	37	51203	1	bearing
6	PM940MC-130	1	Inner separating ring	38	Z5032-2214	1	mat
7	PM940MC-131	1	Outer separating ring	39		6	disc spring
8	PM940MC-132	1	Spindle end cap	40	YSR M20x1.5	1	nut
9	PM940MC-133	3	separating ring	41	PM940MC-111	1	washer
10	YSR M35*1.5	1	nut	42	PM940MC-125	1	shaft end ring
11	6206	1	bearing	43	6X14	2	pin
12	62	2	retaining ring	44	5X16	1	key
13	PM940MC-118	1	spring base	45	17	1	retaining ring
14	ZX40-20122	1	spring plate	46	15	2	retaining ring
15	ZX40-20123	1	spring cap	47	Z5032-3303	2	sleeve
16	PM940MC-117	1	bearing sleeve	48	M5X12	4	screw
17	PM940MC-103	1	spline sleeve	49	M5X10	1	screw
18	6007	2	bearing	50	28	1	retaining ring
19	PM940MCK-214	1	bearing base	51	PM940MC-102	1	spindle
20	ZX40-20304-2	1	arbor bolt cover base	52	ZX40-20012	1	feed base
21	ZX40-20304-1	1	arbor bolt cover	53	ZX40-20128	1	support base
22	PM940MCK-224	1	flange	54	ZX40-20129	1	nut
23	X6320-3228	1	rod	55	ZX40-20130	1	adjust handle
24	M10	1	turn handle	56	ZX40-20131	1	graduated rod
25	PM940MC-105	1	belt	57	ZX40-20021	1	fixed block
26	PM940MC-106	1	belt	58	ZX40-20132	1	scale board
27	PM940MC-107	1	output axis	59	M5X10	1	screw
28	PM940MC-109	1	upper joint tooth	60	2X16	1	pin
29	PM940MC-108	1	lower joint tooth	61	3*20	1	pin
30	PM940MC-104	1	gear	62	M8X30	1	screw
31	6003	1	bearing	64	PM940MC-117	1	pin
32	16001	2	bearing	65	PM940MC-120	1	right plate
33	PM940MC-110	1	separating ring	66	PM940MC-121	1	left plate

No	Code	Qty	Name
67	PM940MC-126	1	speed plate
68	PM940MC-127	1	plate
69	12PJ620	1	transmission belt
70	M12X32	1	adjustble handle
71	62	1	retaining ring
72	8X28	2	key
73	40	1	retaining ring
74	M8X20	4	screw
75	M6X12	4	screw
76	ZX40-20124B	1	fixed bolt
77	ZX40-20203B	1	fixed block
78	ZX40-20202B	1	fixed block
80	PM940MC-115	1	handle
81	PM940MC-114	1	quill
82	Z5030A-20214	1	sleeve
83	PM940MC-113	1	lever shaft
84	M4X10	2	screw
85	5X60	1	pin
86		1	steel ball
87		1	spring
88	M8X20	1	screw
89	Z5030A-20303	1	lable
90	M5X12	3	screw
91	3X10	2	pin
92	M10X35	1	screw
93	M10	1	nut
94	M5X10	24	screw
96	PM940MC-123	1	inner spacer
97	PM940MC-122	1	outer sleeve



BASE

BASE PARTS

No.	Qty.	Code	Name
1	1	PM940M1101	base
2	1	PM940M-1103	column
3	1	ZX40-10021	square flange
4	1	ZX45L-1108	raise and lower base
5	1	ZX40-10025	gib strip
6	3	ZX40-10106	screw
7	4		bearing
8	1	PM940M-1202	table screw
9	2	ZX40-10102	dial clutch
10	2	ZX40-10111	graduated plate
11	2	ZX40-10301	wheel
12	2	ZX40-20305-1B	turn handle
13	2	ZX40-20305-2B	screw
14	1	ZX45L-1107	nut
15	1	ZX40-10117	nut bracket
18	4		screw
19	3		pin
20	2	ZX40-10107	screw
21	3	8	oil cup
22	6		fixed handle
23	4		washer
24	4		washer
25	4		bolt
26	1	ZX40-10120	washer
27	1		screw
28	1	ZX40-10119	plate
29	1	ZX40-10124	protecting cover
30	6		screw
31	6		pin
35	1	PM940M-1102	center base
36	1	ZX40-10012	table
37	1	ZX40-10202	table nut
38	1	ZX40-10203	table base nut
39	1	ZX40-10020	right flange
40	1	ZX40-10019	left flange
41	1	PM940M-1201	table screw

No.	Qty.	Code	Name
42	1	ZX40-10105	dial clutch
43	1		fixed block
44	2		washer
45	2		screw
46	1		screw
47	2		screw
48	1	ZX60-1108	gib strip
49	4		screw
50	2	ZX40-10108	movable fixed block
51	2	ZX40-10109	fixed block support
52	1	ZX40-10023	gib strip
53	2		screw M6X16
54	1	ZX40-10017	raise and lower base
55	1	ZX40-10113	shaft
56	2	ZX40-20109	gear
57	2		bearing
58	1		retaining ring
59	1	ZX40-10015	flange
60	1	ZX45L-1203	raise and lower screw
61	2		bearing
62	2		key6X20
63	1		lock washer
64	1		lock nut
65	7		screw M6X25
66	2		pin 6X30
67	1	ZX40-10018	head handle
68	1		screw M10X20
69	1		turn handle
71	1		motor
72	4		screw
73	1	ZX45L-1106	cover
74	4		screw
75	1	ZX45L-1204	clutch
76	1		gear
77	1		power feed

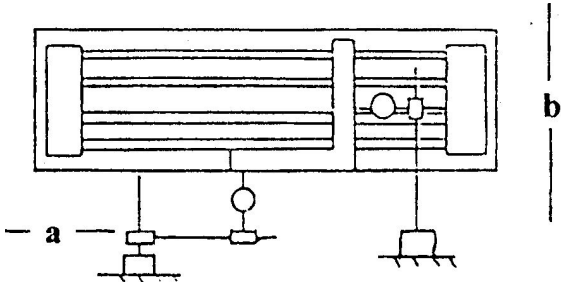
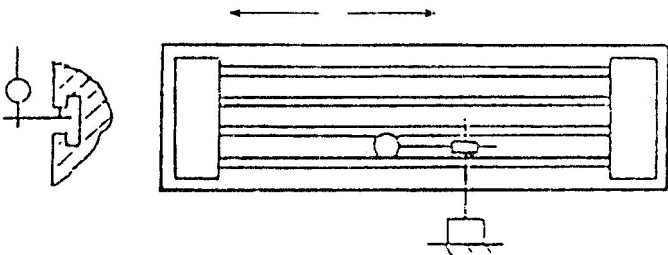
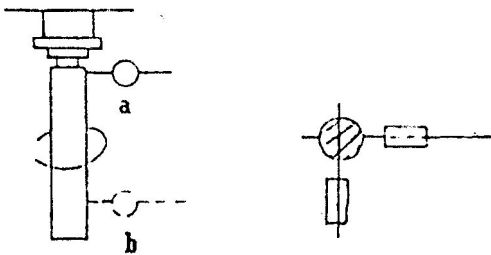
Certificate of Inspection
for
Milling and Drilling Machine
Model PM-940V-PDF

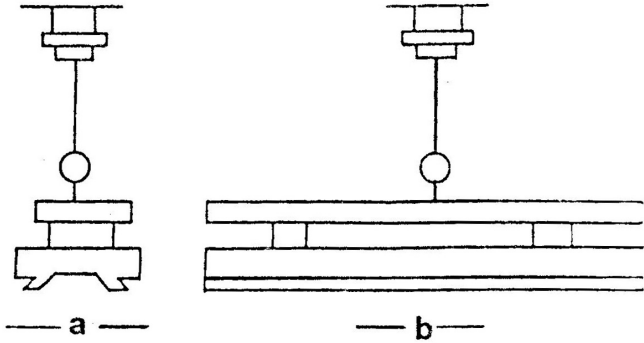
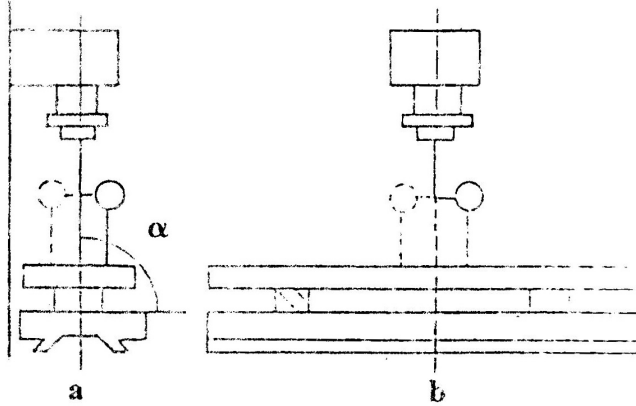
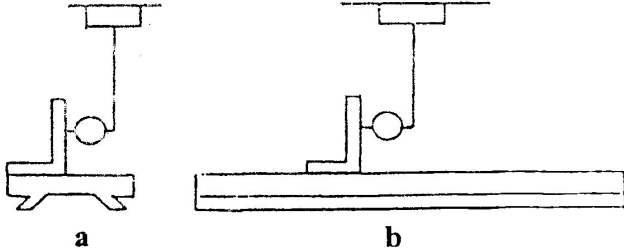
Dispatch No.:

The machine has been qualified and may be permitted to
dispatch

Head of inspection depart_____ Date_____

Director_____ Date_____

ACCURACY TEST FOR MILLING & DRILLING MACHINE			Total 2
			P1
No.	Checking items	Tolerance	Error tested
G1	The flatness of worktable surface 	0.025 for any tested length 200 Max 0.08	
G2	Squareness of worktable longitudinal movement to cross movement 	0.04/300	
G3	Parallelism of worktable longitudinal movement to the base T-slot 	0.05	
G4	Ran-out of spindle hole center line 	a) Near spindle nose 0.015 b) At a distance of 100 from spindle nose 0.02	

ACCURACY TEST FOR MILLING & DRILLING MACHINE			Total 2
			P2
No.	Checking items	Tolerance	Error tested
G5	Parallelism of worktable movement to worktable surface 	a 0.02 for any 100 testing length b 0.03 for any 300 testing Max 0.06	
G6	Squareness of spindle rotating line to worktable surface 	a 0.05/300 $\alpha \leq 90^\circ$ b 0.05/300	
G7	Squareness of spindle sleeve vertical movement to worktable surface 	a 0.05/100 b 0.05/100	

PACKING LIST FOR

MILLING AND DRILLING MACHINE PM940V-PDF

No.	Name	Spec.	Model	Qty
1	Milling & Drilling machine	45		1
2	Draw bar	7/16-20		1
3	Taper shank for drilling chuck	R8		1
4	Drilling chuck	$\Phi 1 \sim \Phi 13$		1
5	Arbor			1
6	T slot bolt	M14×55		2
7	Washer	14		2
8	Nut	M14		2
9	Spanner	22-24		1
10	Oil gun			1
11	Instruction manual			1
12	Certificate of inspection			1
13	Packing list			1

Packing inspector_____

Date_____